THE DECOLORIZATION OF TREATED PALM OIL MILL EFFLUENT (TPOME) BY USING BITTER GOURD (MOMORDICA CHARANTIA) PEROXIDE ENZYME

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ABSTRACT

THE DECOLORIZATION OF TREATED PALM OIL MILL EFFLUENT BY USING BITTER GOURD (MOMORDICA CHARANTIA) PEROXIDE ENZYMES

Palm oil is one of the two most important vegetable oils in the world's oil and fats market. The extraction and purification processes also generate substantial volume of palm oil mill effluent (POME). The environmental impacts of POME cannot be over emphasized; hence the need for treatment measures to reduce these impacts before discharge. The ponding method of POME does not consistently produce an effluent of treated POME (TPOME) that can comply with the discharge limits of Department of Environment (DOE), particularly the color of the effluent which is normally dark grey in colour. In this study enzyme was employed to treat TPOME sample from a local palm oil mill using bitter gourd enzyme *(Momordica charantia)*. The best dosage and pH were determined based on the highest efficiency of colour removal and COD reduction. The experimental results show that the best dosage was 2.1mL/5mL at pH 4.0. The corresponding reductions in COD and colour are both at 84.0%. Since the treatment of TPOME by bitter gourd enzyme did not reduce the colour and COD to below the DOE discharge limits, the resulting TPOME was further treated by photocatalysis using titanium dioxide (TiO_2) and UV radiation. It was found that photocatalysis was still unable to decolorize TPOME because the added enzyme produced more colour after UV radiation. However, to remove further the colour and COD of TPOME, it is recommended to investigate the effect of dosage and isomer type of TiO_2 on decolorization.